UN environment

CMS

CONVENTION ON MIGRATORY SPECIES

UNEP/CMS/COP13/Doc.28.2.9

24 September 2019

Original: English

13th MEETING OF THE CONFERENCE OF THE PARTIES
Gandhinagar, India, 17 - 22 February 2020
Agenda Item 28.2

PROPOSAL FOR A CONCERTED ACTION FOR THE COMMON GUITARFISH (*Rhinobatos rhinobatos*) AND BOTTLENOSE WEDGEFISH (*Rhynchobatus australiae*) ALREADY ON APPENDIX II OF THE CONVENTION, AND THE FAMILIES RHINOBATIDAE AND GLAUCOSTEGIDAE

Summary:

The IUCN Shark Specialist Group has submitted the attached proposal for a Concerted Action for the Common Guitarfish (*Rhinobatos rhinobatos*) and Bottlenose Wedgefish (*Rhynchobatus australiae*), in accordance with the process elaborated in Resolution 12.28.

In addition to the aforementioned CMS-listed species, the families Rhinobatidae, Rhinidae and Glaucostegidae are proposed for Concerted Action because of their similar conservation needs.

*The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CMS Secretariat (or the United Nations Environment Programme) concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author

PROPOSAL FOR A CONCERTED ACTION FOR THE COMMON GUITARFISH (*Rhinobatos rhinobatos*) AND BOTTLENOSE WEDGEFISH (*Rhynchobatus australiae*) ALREADY ON APPENDIX II OF THE CONVENTION, AND THE FAMILIES RHINOBATIDAE AND GLAUCOSTEGIDAE

(i). Proponent: International Union For Conservation of Nature - IUCN Species Survival Commission's Shark Specialist Group (IUCN SSG)

The IUCN SSG has long been a trusted source of science-based information and advice on sharks and their relatives (Class Chondrichthyes: sharks, rays, and chimaeras) and provides leadership for the conservation of threatened species and populations of all chondrichthyan fishes. There are 171 SSG members from 55 countries distributed among 12 ocean-region subgroups. The mission of the IUCN SSG is to secure the conservation, management and, where necessary, the recovery of the world's sharks, rays and chimaeras by mobilizing global technical and scientific expertise to provide the knowledge that enables action.

The IUCN and the CMS Secretariat signed a Memorandum of Cooperation in 2003, which mentions a number of joint activities, including to:

- provide scientific and technical advice on the status and conservation needs of particular migratory species;
- provide technical assistance to develop and implement action plans for migratory species that are, or are proposed to be, subjects of Agreements or Memoranda of Understanding between or among Range states;
- develop guidelines to assist the implementation of CMS and Agreements or MOUs concluded under its auspices; and
- assist or support in capacity-building, research, training and public awareness matters.

(ii). Target species, lower taxon or population, or group of taxa with needs in common:
This Concerted Action involves two species (*Rhinobatos rhinobatos* and *Rhynchobatus australiae*) currently listed on CMS Appendix II, along with three lookalike families (Rhinobatidae, Rhinidae, and Glaucostegidae) that face similar threats. The listed species fall within two of the three families, details are below:

Class: Chondrichthyes
Order: Rhinopristiformes
Family: Rhinobatidae
Species: *Rhinobatos rhinobatos* – Common Guitarfish

Class: Chondrichthyes
Order: Rhinopristiformes
Family: Rhinidae
Species: *Rhynchobatus australiae* – Bottlenose Wedgefish

As identification to the species level can be difficult, and threats and status are similar within the families Rhinobatidae (guitarfishes), Rhinidae (wedgefishes), and Glaucostegidae (giant guitarfishes), the IUCN SSG proposes that they all be included in this CMS Concerted Action.

"Rhino Ray" is a term used collectively for the five family-level groups of the Rhinopristiformes (Pristidae, Rhinobatidae, Rhinidae, Glaucostegidae, and Trygonorrhinidae). For the purposes of this document, the term Rhino Ray will be used to refer specifically to the three families Rhinobatidae, Rhinidae, and Glaucostegidae.

Below we will provide details regarding *R. rhinobatos* and *R. australiae* specifically as they are currently listed on CMS Appendix II, and the three families more generally.

(iii). Geographical range:

The three families Rhinobatidae, Rhinidae and Glaucostegidae (Rhino Rays) were previously common in soft-bottom habitats of shallow, warm waters worldwide.

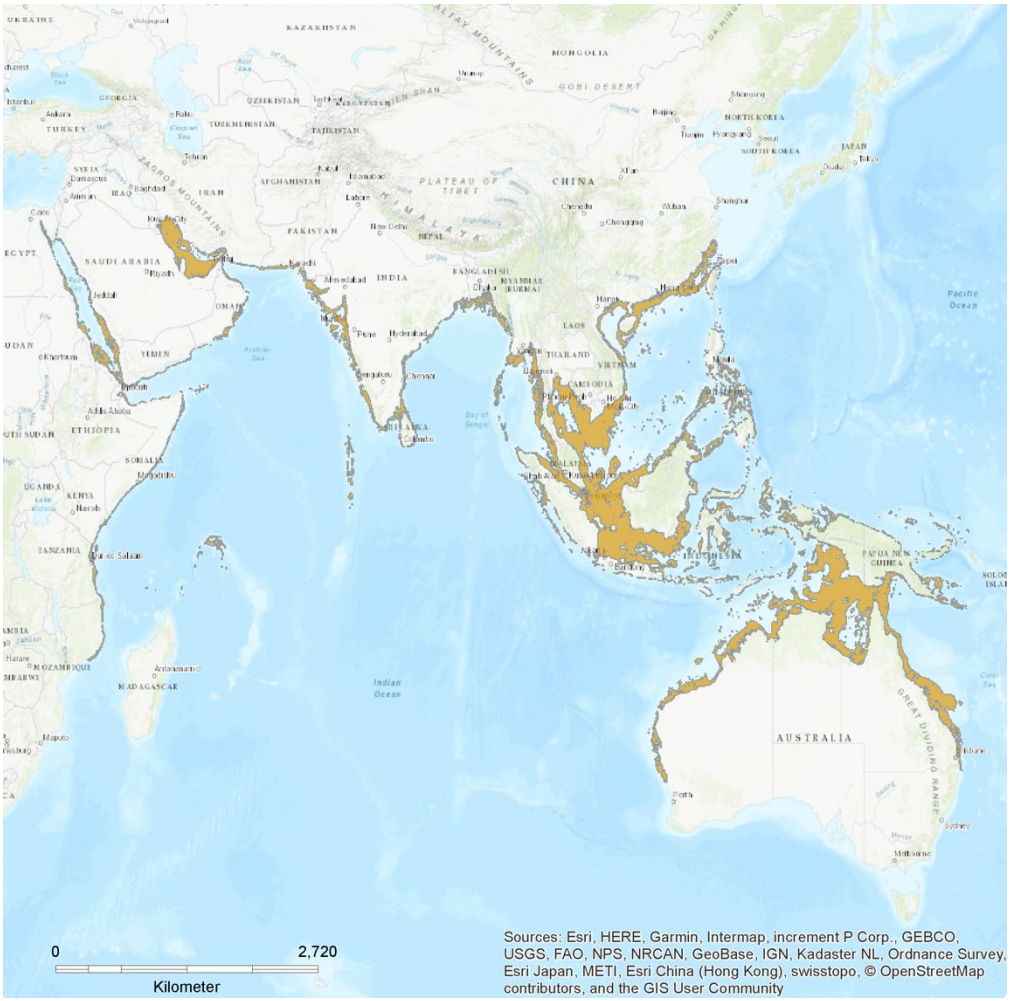
The general geographic range of the Rhinobatidae can be broken down into their three genera: species of the genus *Rhinobatos* are present from the western central Pacific to the eastern central Atlantic including the Mediterranean Sea; *Acroteriobatus* spp. are present throughout the Western Indian Ocean and South-eastern Atlantic; and *Pseudobatos* spp. are present in the eastern central and south-east Pacific, and the western central and south-west Atlantic.

Species in the family Rhinidae are found predominantly in the Indo-West Pacific, with two species residing in the eastern central Atlantic along the West African coast.

The centre of diversity for the family Glaucostegidae is the Indo-West Pacific, with one species in the Mediterranean Sea and south central eastern Atlantic along the West African coast.

Common Guitarfish (*Rhinobatos rhinobatos*) is distributed from the southern Bay of Biscay (north of Spain) to Angola, including the Mediterranean Sea. Bottlenose Wedgefish (*Rhynchobatus australiae*) is found in the Indo-West Pacific from Mozambique to the Solomon Islands and north to Taiwan, rarely occurring deeper than 60 m.

Common guitarfish (*Rhinobatos rhinobatos*) geographical range (https://www.iucnredlist.org/species/63131/12620901)



Bottlenose Wedgefish (*Rhynchobatus australiae*) geographical range (https://www.iucnredlist.org/species/41853/68643043)

(iv). Summary of Activities:

The IUCN SSG is proposing nine activities to improve the conservation status of Rhino Rays. These comprise: (1) creating a network of researchers and policy makers; (2) increasing data collection and research; (3) launching national campaigns to build public support for species protection; (4) developing a Global Rhino Ray Action Plan; (5) running workshops aimed at improving identification, and produce identification guides; (6) researching options to reduce fishing mortality; (7) building regional capacity and encouraging local engagement and education to minimize fishing mortality and improve fisheries and trade management; (8) hosting regional conservation planning workshops; and, (9) increasing Rhino Ray policy based protections.

(v). Activities and expected outcomes:

The purpose of this Concerted Action is to outline the actions required to mobilize Rhino Ray conservation on a global level, however many of these actions can and must be implemented on a regional level. International cooperation in the planning and mitigation of threats are vital to improve the conservation status of Rhino Rays, but while as a group they share similar threats, there are regional differences in threat levels, fisheries activities, regulations and conservation measures, and local species knowledge, highlighting the need for specific regional actions. To ensure effective implementation of conservation strategies for Rhino Rays, Parties are strongly advised to fully include relevant stakeholders in the process including fishers, fisheries officers, and non-governmental organizations (NGO).

The following Activities Table outlines the activities, outcomes, timeframe, responsibility, and funding.

Activity	Outputs / Outcomes	Timeframe	Responsibility	Funding
Create a network of researchers and policy makers	• Data and research are shared and promoted among researchers • Collaboration opportunities are identified and promoted to increase conservation action • Local communities are engaged through citizen science projects • Students are engaged in research projects for long term capacity building	Has begun and will be ongoing	IUCN SSG	No funding needed
Increase data collection and research	• Improved species-specific estimates of catch and abundance to generate better understanding of the current distribution • Identification of critical habitat including movement pathways and aggregation sites for breeding, nursing, feeding, and mating • Improved understanding of life history characteristics (age, growth, reproduction, etc.) • Improved understanding of drivers of the trade and utilization of various Rhino Ray products (e.g. fins, meat, snout, skin, thorns) • Improved fisheries reporting and data collection • Publish a journal issue focusing on Rhino Rays	Open ended and ongoing	Range State Parties, NGOs, researchers	Fundraising required
Start an international campaign to gain public support for species protection	• International Rhino Ray Day is created and promoted, following the example of International Sawfish Day	Open ended and ongoing	IUCN SSG, NGOs	No funding needed

Activity	Outputs / Outcomes	Timeframe	Responsibility	Funding
Develop a Global Rhino Ray Action Plan, using *Sawfish: a Global Strategy for Conservation* as a template for priority actions	• Parties respond to a survey to identify gaps in knowledge, conservation, and management • CMS Secretariat support the IUCN with undertaking the survey (e.g. circulating the survey among Focal Points). • Parties and Range States (and other relevant stakeholders) consulted during the development of the Action Plan • Global action plan is used as a template for future Funding dependent • regional action plans	Funding dependent	IUCN SSG, Range State Parties, NGOs, Secretariat, researchers	Fundraising needed ~US$40k for development of action plan
Produce identification guides and run identification workshops for key groups such as fishers, law enforcement and compliance, fisheries officers, recreational anglers, and fisheries and landings observers	• Improved ability to identify Rhino Rays to species level • Improved fisheries reporting and data collection • Improved compliance with species protections where they exist	Ongoing and open ended	Range State Parties, NGOs	Fundraising needed for ID guide production and workshop hosting
Research options to reduce fishing mortality	• Options for reducing mortality are explored (e.g. alternative livelihoods, compensation for fisheries exclusion) • Fishing gear that reduces bycatch (exclusion devices, circular hooks etc.) is researched and adopted	Funding dependent	Range State Parties, NGOs	Fundraising needed to explore options, educate fishers, and adopt new methods
Build regional capacity and encourage local engagement and education to minimize fishing mortality and improve fisheries management	• Factsheets and educational campaigns/materials are created for general public to increase knowledge of species' biology and status to encourage a reduction in fishing mortality • Local communities and stakeholders are targeted	Open ended and ongoing	Range State Parties, NGO's, IUCN SSG	Fundraising required

Activity	Outputs / Outcomes	Timeframe	Responsibility	Funding
	to reduce fishing mortality through awareness of projections, bycatch mitigation, safe handling and release etc. • CMS listings in Appendix II are publicised • Demand for fins and other products, including snouts, is reduced, particularly in countries with high demand such as Singapore, People's Republic of China and Hong Kong Special Administrative Region • Range States encouraged to increase fisheries observer coverage where appropriate • Range States encouraged to improve traceability of products			
Regional workshops	• Data is compiled and options that will strengthen Funding Range State Parties, Fundraising needed • conservation efforts are explored • Regional action plans are produced within the context of global priorities • Rhino Rays are highlighted as priority species in National Plans of Action (NPOAs)	Funding dependent	NGOs	~US$30k per workshop
Increased Rhino Ray policy based protections	• Increased number of Range States as Signatories to the Sharks MOU to agree to endeavour to pursue MOU objectives • Range States encouraged to set and enforce zero catch for population recovery through no-take zones, temporal restrictions, or prohibiting certain fishing gear • Parties to develop and implement national legislation for Rhino Ray protection	Open ended	Range State Parties already Signatories to the Sharks MOU, NGOs	No funding needed

(vi). Associated benefits:

The intention of the proposed activities is to catalyze effective conservation of Rhino Rays. These activities will also provide opportunities for Parties to collaborate and coordinate their conservation actions. Particularly, regional workshops will allow direct participation of Range States and encourage continued growth and active participation of a developing stakeholder network. This capacity building will be invaluable in future activities concerning all wedgefishes and guitarfishes, as well as sawfishes and angel sharks.

Gabon has proposed a Concerted Action for the four families Pristidae, Rhinobatidae, Rhinidae and Glaucostegidae, and will thus act as a leader in national conservation of these species. The IUCN SSG and Gabon are working together to ensure communication and effective partnership in future Action Plans. Our collaboration will be mutually beneficial and act as a guide for future partnership and encourage other regional conservation action by Parties.

Globally there is strong interest in sawfish research and conservation, but research efforts have been limited by low population numbers making studies challenging. There are five species of sawfish, of which two are Endangered and three are Critically Endangered according to the IUCN Red List of Threatened Species. All species of sawfish are included in CMS Appendices I and II (2014) of the Convention and Annex I of the Sharks MOU (2016). There is significant habitat, range, and depth overlap between the three families in this Concerted Action and sawfishes; encouraging research and conservation focus in these areas will benefit sawfish as well.

Similarly, angelsharks (*Squatina* spp.), which suffer from the same threats inhabit the same regions as many Rhino Rays. Particularly, *Squatina squatina*, *Squatina aculeata*, and *Squatina oculata* will benefit from improved enforcement of regulations in the Mediterranean. *S. squatina* is listed on CMS Appendix I & II (2017), and the Sharks MOU (2018), and was assessed as Critically Endangered by the IUCN Red List (Morey *et al.* 2019).

(vii). Timeframe:

Please refer to table 1 above for details.

(viii). Relationship to other CMS actions:

In listing *R. rhinobatos* on Appendix I (Mediterranean Sea population) and Appendix II (global population), and *R. australiae* on Appendix II of the Convention, CMS Parties have already agreed that these species would benefit from a Concerted Action and international cooperation.

Gabon has submitted a Concerted Action for the families Pristidae, Rhinobatidae, Rhinidae, and Glaucostegidae with regional actions, which will complement the Concerted Action proposed here by the IUCN SSG. Together these proposed Concerted Actions highlight the need for regional and global conservation of these imperiled families, while emphasizing the feasibility of conservation actions at varying scales. The preparation of a Global Rhino Ray Action Plan will provide the global priorities and context on which regional plans can be based off.

Rhinobatos rhinobatos and *R. australiae* are also listed in the Sharks MOU (2018). This aims to guide international cooperation to maintain and achieve a sustainable conservation status for migratory sharks and rays included in its Annex 1. The Concerted Actions would support the overall implementation of the Sharks MOU, particularly in improving the understanding of migratory shark populations and enhancing national, regional, and international cooperation.

The CMS Scientific Bycatch Working Group reviews existing measures to mitigate and reduce bycatch of CMS species and aims to ensure that recommended measures benefit

all taxa. The results of the proposed Concerted Actions would also contribute to this work (in particular, Activity 8 outlined above).

(ix). Conservation priority:

Rhinobatos rhinobatos and *R. australiae* share common threats: (1) they possess some of the highest value fins on the international market resulting in targeted catch and retained bycatch (Notarbartolo di Sciara *et al*. 2007, Dulvy *et al*. 2014, Jabado 2018, Kyne *et al.* 2019a); (2) their morphology makes them highly susceptible to being caught as bycatch in many types of fishing gear (Moore 2017); and, (3) their dependence on inshore habitats makes them highly exposed to intensive fisheries, as well as habitat loss and degradation (Jabado *et al.* 2018).

Rhinobatos rhinobatos is listed globally on CMS Appendix II (2017), CMS Appendix I and II (2017) for the Mediterranean Sea Population, and in the CMS Sharks MOU (2018). It is classified as Endangered on the IUCN Red List on the basis of past and suspected future declines (Notarbartolo di Sciara *et al.* 2007).

Historically, *R. rhinobatos* ranged from shallow coastal waters down to 180 m depth throughout the Mediterranean and sub-tropical regions of the eastern Atlantic from the Bay of Biscay to Angola (Notarbartolo di Sciara *et al.* 2007). Currently, *R. rhinobatos* is locally extinct from much of the northern Mediterranean and is no longer recorded from the Atlantic coast of Europe due to long-term intensive fishing pressure (Fowler *et al*. 2005, Notarbartolo di Sciara *et al.* 2007).

Fishing pressure is the largest threat facing *R. rhinobatos*, followed by habitat loss and destruction. *R. rhinobatos* migrate seasonally from deep water into shallow coastal areas to give birth and mate, during this time they are targeted by coastal fisheries for meat and fins and are also taken as bycatch in net and trawl fisheries (Newell 2017, Moore *et al.* 2019). Little is known about how *R. rhinobatos* moves along coastal and marine habitats, however given that seasonal migration takes place in shallow water, breeding guitarfishes are particularly susceptible to coastal gillnet and trawl fishing activities.

Rhynchobatus australiae, is listed on CMS Appendix II (2017), the CMS Sharks MOU (2018), and is assessed as Critically Endangered on the IUCN Red List as it is inferred that the species has undergone a >80 per cent population reduction over the last three generations (Kyne *et al.* 2019a, 2019b).

Rhynchobatus australiae is subject to overfishing in artisanal and commercial fisheries; they are caught as target species and as bycatch primarily for their internationally valuable fins. Their use of inshore habitat, susceptibility to multiple gear types, and range located in some of the world's most heavily fished coastal regions makes them particularly susceptible, and their population has been locally reduced throughout their range (Giles *et al.* 2016, Kyne *et al.* 2019b). While species-specific catch and landings data are lacking, *R. australiae* have suffered significant population declines, and it is inferred that they have undergone a >80 per cent global population decline over the last three generations (45 years) (Kyne *et al.* 2019b).

Both *R. rhinobatos* and *R. australiae* have an unfavourable conservation status as defined under the Convention as they do not meet the conditions outlined in subparagraph 1 C of the Convention Text.

The July 2019 IUCN Red List Update identifies Rhinidae and Glaucostegidae as the most threatened group of all marine fishes. Cumulatively, 94 per cent of species comprising these two families face an 'extremely high risk of extinction' according to the most recent IUCN Red List Assessments. The reassessment of Red List status for the Rhinobatidae is not yet complete, but currently 24 per cent% are assessed as threatened with extinction. As identification to the species level can be difficult and threats are similar within the three families (Rhinobatidae, Rhinidae, and Glaucostegidae), we propose that they all be included in the CMS Concerted Action.

Coordinated and comprehensive management and conservation measures are urgently needed to prevent further population declines and both regional and global extinctions of Rhino Rays. Cooperation between Range States to mitigate obstacles to migration, conserve their habitat, and protect the species through international cooperation to regulate target and bycatch fisheries (particularly those associated with seasonal breeding migrations) is desperately needed. Ensuring that catches are sustainable and legal will help prevent the extinction of Rhino Rays. It is likely that without trade regulation, the high value of fins will drive continued overfishing and global declines. This is a serious threat to the survival of wild populations and is similar to the fate of sawfishes which have been eliminated from almost all of their historic range (Moore 2017).

(x). Relevance:

Rhinobatos rhinobatos exhibits seasonal migration based on its reproductive cycle, with females visiting shallow waters for parturition (Newell 2017). During this predictable movement, breeding adults can easily be targeted by fisheries or taken as incidental bycatch. *Rhinobatos rhinobatos* experiences unregulated target fisheries in southern and eastern Mediterranean waters and is one of the main targets of specialized shark fishing teams in their West African range. As there is still significant uncertainty about how *R. rhinobatos* migrates in shallow waters, the species would benefit from coordinated international management structures to obtain more data and a better understanding of existing populations.

Data are lacking on the migratory behaviours of *R. australiae.* However, other Rhino Ray species are generally migratory (e.g. those in families Pristidae, Rhinobatidae, and Glaucostegidae; Lessa and Vooren 2007, Márquez-Farías 2007, Blanco-Parra *et al.* 2009, Fowler 2014). As well, recent data show that there is probably episodic migration between Indonesia and Australia (Giles *et a l.* 2016). Coordinated and comprehensive management and conservation measures are urgently needed to prevent further population declines and localized, regional, or even global extinctions throughout its range, particularly as migrations likely happen at a scale spanning national boundaries.

In general, the large size, motility, and morphology of many Rhino Rays suggest they are likely to cross national boundaries. Any national conservation initiatives aimed at preventing Rhino Rays from further population declines are unlikely to be successful if the animals are not protected during seasonal migrations in waters beyond national jurisdictions. Therefore, Parties need to work together in developing effective conservation measures.

The activities outlined in this document will also contribute to the implementation of Resolutions 11.20 on the Conservation of Migratory Sharks and Rays; and 12.22 on Bycatch.

(xi). Absence of better remedies:

This Concerted Action is directly addressing the need for range-wide coordination and will enable strategic collaboration among Parties to work together on developing and implementing activities. The CMS Network is the ideal platform for improving knowledge of Rhino Rays and developing a Global Rhino Ray Action Plan. Partners to CMS, such as engaged researchers and NGO's, are able to support these actions once they have been adopted by governments through the existing linkages that CMS has created. While national protections are a much needed remedy, given the migratory nature of Rhino Rays, a Concerted Action is appropriate

Rhinobatos rhinobatos is not listed under CITES, but *R. australiae*, Glaucostegidae spp. and Rhinidae spp. are now listed on CITES Appendix II (2019). New listings on CITES will enable regulation of the trade of these species, however CMS will be critical in order for parties to collaborate in the conservation of Rhino Rays.

(xii). Readiness and feasibility:

Israel, Mauritania, Senegal and Togo have already taken the lead on the listing proposal of *R. rhinobatos* in CMS Appendix II (Appendix I for the Mediterranean Sea population). The Government of the Philippines successfully listed *R. australiae* on CMS Appendix II.

Gabon is submitting a Concerted Action addressing the four families Pristidae, Rhinobatidae, Rhinidae and Glaucostegidae, and will be well placed to demonstrate effective leadership in conserving Rhino Rays at a national level.

The IUCN SSG has taken the lead in establishing a Rhino Ray Network to enable effective sharing of data and information. The IUCN SSG has experience producing global conservation strategies and will lead on the publication of the Global Rhino Ray Action Plan which will support range state countries in planning, implementation, and management for the conservation of Rhino Rays.

The Save Our Seas Foundation (SOSF) has released a special call for 2020 keystone grant applications aimed at supporting projects that promote the recovery of Rhino Rays, specifically sawfishes, wedgefishes, and guitarfishes. As well, the Shark Conservation Fund (SCF) is supportive of projects focusing on the most imperiled endemic species and endangered families of sharks and rays such as sawfish, angelsharks, wedgefish, and guitarfish. These funding opportunities will likely provide much needed support in advancing Rhino Ray conservation efforts.

See Actions Table above for further details.

(xiii). Likelihood of success:

A Global Strategy for Conservation was created for sawfish following a workshop led by the IUCN SSG in 2012. A group of 29 experts representing expertise from 48 countries around the world gathered and developed a focused global action plan to bring these iconic species back from the brink of extinction. At the same time, the IUCN SSG created a Sawfish Network and tri-annual newsletter to foster collaboration and encourage research on this group of species. These methods were very successful in building regional capacity and putting the plight of sawfish in the spotlight. Following the same methods, we can now build upon previous sawfish work and existing networks to expand our coverage to include Rhino Rays. An online Rhino Ray network has already been established and has been merged with the existing sawfish newsletter. Members of this network will be the basis for continued expansion and a source of future collaboration in the proposed Rhino Ray Action Plan and will help us identify regional experts to champion conservation in their range states.

There is a strong foundation and organizational experience to build upon to successfully implement the Concerted Actions. The Sharks MOU Signatories and Cooperating Partners will be invited to support the development and implementation of the action plans to further increase the likelihood of success.

There are some risk factors associated with the Concerted Action; there is a general lack of capacity in species identification, catch and abundance information, and commitment from national agencies. However, by working with Parties the IUCN SSG can bring global actions into on the ground regional and national planning.

(xiv). Magnitude of likely impact:

There is a total of 45 Rhino Ray species covered in this Concerted Action, of which 33 are in the family Rhinobatidae, 10 in the family Rhinidae, and 6 in the family Glaucostegidae. Combined, nearly half (22/45, or 48.9 per cent) are currently threatened with an elevated risk of extinction: 17 (37.8 per cent) Critically Endangered, 1 (2.2 per cent) Endangered, and 4 (8.9 per cent) Vulnerable. A further 10 (22.2 per cent) are Data Deficient. Many species in this group have suffered steep and ongoing population declines (Kyne *et al.*

2019a). A full list of countries where these species occur can be found on the IUCN Red List website (https://www.iucnredlist.org/).

While the specific role of Rhino Rays in the ecosystem is poorly understood, members of the Rhinobatidae family have been shown to occupy intermediate trophic levels and as predators are likely to exert direct pressure on all trophic levels (Navia *et al.* 2016). Furthermore, Rhino Rays can act as an important prey item for apex predators vital to ecosystem functioning (Moore, 2017). Demographic analysis of nine species of Rhino Rays has shown that most species have a moderate or high capacity to recover quickly from population declines when fishing mortality is reduced to low levels (D'Alberto *et al.* 2019). This demonstrates that this Concerted Action will have significant benefits to Rhino Ray populations.

The range of many Rhinobatidae, Rhinidae, and Glaucostegidae overlap with another imperiled Rhino Ray family; the Pristidae (comprised of five species of sawfishes). Thus, conservation actions targeting these families may also be beneficial to the wider Rhinopristiformes as a whole. Rhino rays will also act as a flagship species for a wider group of coastal fisheries and bycatch issues, specifically actions and activities undertaken for this group will benefit sawfish monitoring and implementation.

In addition, successful implementation could result in:

- Benefits to science though increased data and information
- Improved communication and expanded research network with increased knowledge and technique sharing
- Increase in political will and resourcing with greater commitment from Range States
- Increased local and regional capacity to address bycatch

(xv). Cost-effectiveness:

Funding required is outlined in the Activities Table above.

No funding is needed to create a network of researchers, start an international campaign to gain public support for species protection, or increase policy-based protections (activities 1, 3, and 9 respectively).

Activity 2, increased data collection and research, requires funding. If funding is acquired and data collection and research are increased, the results could directly feed into future action plans, and activities 6 (minimize fishing mortality) and 7 (build regional capacity). Activities 6 and 7 all require funding, however much of the research costs overlap, thus increasing the impact and reach of activity 2.

Approximately US$40k of funding will be required to develop and produce a Global Rhino Ray Action Plan (activity 4). The production of this document will catalyze future regional action plans and as it can be used as a template, will enable them to be produced much more cost effectively and efficiently. The promotion of this Action Plan will also help foster public support for species protection (activity 3).

Activity 5, the production of identification guides and identification workshops will require fundraising. By creating a network of researchers, it is our hope that actions such as this can be replicated and shared among Range States so as to keep the activity as cost effective and reproducible as possible.

Approximately $30k of funding will be required for each regional workshop (activity 8). However, these are a cost-effective approach to reach multiple stakeholders and accomplish species- and region-specific actions. As well, the IUCN SSG is experienced in hosting successful workshops thus if involved in regional workshops there would be cost savings associated with collective existing knowledge and efficiency. Funding acquired for regional workshops will also result in increased regional capacity and planning

By encouraging cooperation between Range States through this Concerted Action, any conservation successes can be replicated, and best practices encouraged through collaboration, which will be more cost-effective than for Range States to work in solitude.

(xvi). Consultations-Planned/Undertaken:

The IUCN SSG and Gabon are working together to ensure communication and effective partnership in future Action Plans. The IUCN SSG has already circulated a survey to the Rhino Ray Network and the CMS Secretariat has supported the IUCN SSG in this undertaking by circulating the survey amongst Focal Points. Through existing Red Listing Workshops, the IUCN SSG has consulted with regional experts to determine potential interest levels and has further promoted the survey. Furthermore, the Rhino Ray network was advertised to all IUCN SSG members from 51 countries through the IUCN SSG Newsletter, and the existing Sawfish Network Newsletter.

References

D'Alberto, B.M., Carlson, J.K., Pardo, S.A. and Simpfendorfer, C.A. 2019. Population productivity of wedgefishes, guitarfishes, and banjo rays: inferring the potential for recovery. Preprint available at: https://www.biorxiv.org/content/10.1101/584557v2

Dulvy, N.K., Fowler, S.L., Musick, J.A., Cavanagh, R.D., Kyne, P.M., Harrison, L.R., Carlson J.K., Davidson, L.N.K., Fordham S.V., Francis, M.P., Pollock, C.M., Simpfendorfer, C.A., Burgess, G.H., Carpenter, K.E., Compagno, L.J.V., Ebert, D.A., Gibson C., Heupel, M.R., Livingstone, S.R., Sanciangco, J.C., Stevens, J.D., Valenti, S. and White W.T. 2014. Extinction risk and conservation of the world's sharks and rays. *eLife* 2014(3): e00590.

Fowler, S., Cavanagh, R., Camhi, M., Burgess, G., Cailliet, G., Fordham, S., Simpfendorfer, C. and Musick, J. 2005. *Sharks, Rays and Chimaeras: the Status of the Chondrichthyan Fishes*. IUCN Publication Services Unit, Cambridge, UK. Pp. 461.

Fowler, S. 2014. The Conservation Status of Migratory Sharks. UNEP /CMS Secretariat, Bonn, Germany.

Giles, J. L., Riginos, C., Naylor, G.J.P., Dharmadi, and Ovenden, J.R. 2016. Genetic and phenotypic diversity in the wedgefish *Rhynchobatus australiae*, a threatened ray of high value in the shark fin trade. *Marine Ecology Progress Series* 548: 165–180.

Jabado, R.W., Kyne, P.M., Pollom, R.A., Ebert, D.A., Simpfendorfer, C.A., Ralph, G.M., Al Dhaheri, S.S., Akhilesh, K.V., Ali, K., Ali, M.H., Al Mamari, T.M., Bineesh, K.K., El Hassan I.S., Fernando, D., Grandcourt, E.M., Moazzam Khan, M., Moore, A.B.M., Owfi, F., Robinson, D.P., Romanov, E., Soares, A.-L., Spaet, J.L.Y., Tesfamichael, D., Valinassab, T. and Dulvy, N.K. 2018: Troubled waters: Threats and extinction risk of the sharks, rays and chimaeras of the Arabian Sea and adjacent waters. *Fish and Fisheries* 19(6): 1043–1062.

Jabado, R.W. 2018. The fate of the most threatened order of elasmobranchs: shark-like batoids (Rhinopristiformes) in the Arabian Sea and adjacent waters. *Fisheries Research* 204: 448-457.

Jabado, R. W., Kyne, P.M., Pollom, R.A., Ebert, D.A., Simpfendorfer, C.A., Ralph, G.M. and Dulvy, N.K. 2017. The conservation status of sharks, rays, and chimaeras in the Arabian sea and adjacent waters. Environment Agency-Abu Dhabi, UAE and IUCN Species Survival Commission Shark Specialist Group. Vancouver, Canada. 236pp.

Kyne, P.M., Jabado R.W., Rigby C.L., Dharmadi, Gore M.A., Pollock C.M., Herman K.B., Cheok J., Ebert D.A., Simpfendorfer C.A. and Dulvy, N.K. 2019a. The thin edge of the wedge: extremely high extinction risk in wedgefishes and giant guitarfishes. *bioRxiv* 595462.

Kyne, P.M., Rigby, C.L., Dharmadi and Jabado, R.W. 2019b. *Rhynchobatus australiae*. *The IUCN Red List of Threatened Species* 2019: e.T41853A68643043. http://dx.doi.org/10.2305/IUCN.UK.2019-2.RLTS.T41853A68643043.en

Lessa, R. and Vooren, C.M. 2007. *Rhinobatos horkelii*. *The IUCN Red List of Threatened Species* 2007: e.T41064A10396152. http://dx.doi.org/10.2305/IUCN.UK.2007.RLTS.T41064A10396152.en

Márquez-Farías, J.F. 2007 Reproductive biology of shovelnose guitarfish *Rhinobatos productus* from the eastern Gulf of California México. *Marine Biology* 151: 1445–1454.

Moore, A.B.N. 2017. Are guitarfishes the next sawfishes? Extinction risk and an urgent call for conservation action. *Endangered Species Research* 34: 75–88.

Moore, A.B.M, Séret, B. and Armstrong, R. 2019. Risks to biodiversity and coastal livelihoods from artisanal elasmobranch fisheries in a Least Developed Country: The Gambia (West Africa). *Biodiversity and Conservation*. 28: 1431–1450

Morey, G., Barker, J., Hood, A., Gordon, C., Bartolí, A., Meyers, E.K.M., Ellis, J., Sharp, R., Jimenez-Alvarado, D. and Pollom, R. 2019. *Squatina squatina*. *The IUCN Red List of Threatened Species* 2019: e.T39332A117498371. http://dx.doi.org/10.2305/IUCN.UK.2019-1.RLTS.T39332A117498371.en.

Navia, A.F., Mejía-Falla, P.A., López-García, J., Giraldo, A. and Cruz-Escalona, V.H. 2016. How many trophic roles can elasmobranchs play in a marine tropical network*? Marine and Freshwater Research*. 68: 1–12.

Newell, B.M. 2017. Status Review Report of Two Species of Guitarfish: Rhinobatos rhinobatos and Rhinobatos cemiculus. Report to National Marine Fisheries Service, Office of Protected Resources. 62 pp.

Notarbartolo di Sciara, G., Bradai, M.N., Morey, G., Marshall, A.D., Compagno, L.J.V., Mouni, A., Hicham, M., Bucal, D., Dulvy, N., Heenan, A. and Rui Coelho. 2007. *Rhinobatos rhinobatos. The IUCN Red List of Threatened Species* 2007: e.T63131A12620901. http://dx.doi.org/10.2305/IUCN.UK.2007.RLTS.T63131A12620901.en.